

SILANE BASED COATINGS ON GLASS FIBER REINFORCEMENTS IN GYPSUM BOARD

ABSTRACT

5 A bond is created between a gypsum matrix and a silane-based sizing
composition coated onto a glass fiber and gypsum matrix during manufacture
of gypsum board. Hydrophilic water extraction at the gypsum matrix-sizing
interface reduces void formation and promotes the growth of smaller calcium
sulphate dihydrate crystals within larger calcium sulphate dihydrate crystals
10 in microstructurally identifiable regions adjacent to the glass fiber. The
resulting gypsum board exhibits excellent strength, flexure resistance and
nail pull out resistance. An alternative approach utilizes a silane based sizing
composition having branched chains that diffuse into a wet gypsum mix.
During gypsum cure, the diffusion triggers formation of pseudo polymeric
15 networks in a microstructurally identifiable region adjacent to the glass fiber.
Bonds formed between the gypsum matrix and the silane based sizing
composition increase the strength, flexure resistance and nail pull out
resistance of the gypsum board.